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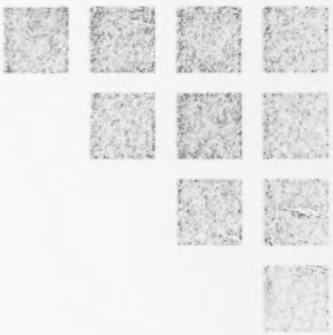
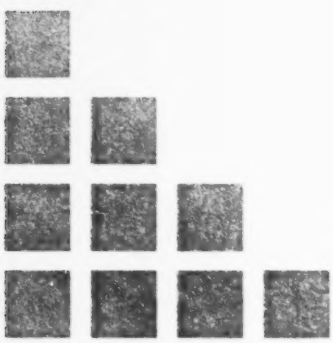


Patterns of Young Children's Development: An International Comparison of Development as Assessed by Who Am I?

R-02-5E

by
Molly de Lemos
April 2002

Research Paper



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An International Comparison of Development as Assessed by *Who Am I?*

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Molly de Lemos

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Abstract

There has, in recent years, been a reemergence of interest in the early years and a renewed emphasis on the importance of early education programs to ensure that all children start school ready to learn. At the same time, the move toward evidence-based policy development has led to the need to demonstrate the effectiveness of early education programs in terms of measured outcomes. Questions have also been raised with regard to the effectiveness of different types of programs and approaches, and the age at which such programs should be introduced.

In order to evaluate the outcomes of early education programs, it is necessary to have a measure that can assess the impact of programs in terms of the development of the underlying skills that are associated with subsequent learning and achievement at school.

This paper provides information on a measure that was developed to assess children's level of development at preschool and entry to school level, as well as their readiness for formal schooling. This measure, *Who Am I?*, is based on early copying and writing skills, and is designed to identify the broad stages of development that underlie children's readiness for more formal learning in a school situation.

Although originally developed in Australia, *Who Am I?* has now been used in studies in a number of different countries, including Canada. Data from these studies provide some insight into the variations in development that are associated with different patterns of preschool provision and different ages of entry into an educational program.

The results reported in this paper indicate variations in the patterns of development of young children according to both age and schooling. Development of early copying and writing skills is accelerated in cases where children enter preschool at an early age and are exposed to formal teaching of early reading and writing skills, as in Hong Kong. However, less formal preschool programs and later entry to school, as in Sweden, result in a delay in the acquisition of early writing skills. Delayed development is also noted in the case of children from relatively poor home backgrounds who do not attend preschool prior to entry to school, as in the case of children in a remote rural area of Northern India. However, there are close similarities in development between children of the same age in Canada and in Australia, who are either at the end of their senior kindergarten year or in their first year of school. Using *Who Am I?* as a measure of school readiness, it was found that by age six years virtually all children had reached a level of development where they were able to copy geometrical forms and to write at least some letters or words, indicating that they were ready to benefit from a more structured school program.

The results of these studies indicate that *Who Am I?* provides a valid measure of development across different language and cultural groups, and can, therefore, be used as a tool to evaluate the effectiveness of different forms of early childhood provision, as well as children's readiness for more formal learning in a school situation.

Acknowledgements

The comparison of children's development as assessed by *Who Am I?* across different countries and reported in this paper was made possible through the collaboration of colleagues in various countries. As an Honorary Fellow, and former Senior Research Fellow, of the Australian Council for Educational Research (ACER), I am indebted to my colleague, Brian Doig, of ACER for his support in the initial development of *Who Am I?* and his contribution to the construction of the final published version of *Who Am I?*, as well as to Katherine Cox and Catherine Underwood who undertook the tasks of scoring and data entry for the Australian study. In the case of the Hong Kong data, I am indebted to Elizabeth Mellor, of the Centre for Applied Studies in Early Childhood Education at the Queensland University of Technology, and Leung Wai Man, of the Hong Kong Institute of Education, who arranged for the administration of *Who Am I?* to children in a number of preschools in Hong Kong, and to Margaret Wu, of the Australian Council for Educational Research, who undertook the scoring of responses in Chinese script. In the case of the Indian data, I am indebted to Dr. Neelam Sood, of the National Institute of Educational Planning and Administration in New Delhi, for making available the results of her study in which *Who Am I?* was used in the context of a broader investigation of early childhood provision in a remote rural area of Northern India. In the case of the Swedish data, I am indebted to Professor Gunilla Fredriksson, of Linkopings University, who agreed to trial *Who Am I?* in a number of preschools and preschool classes in Sweden. In the case of the Canadian data, I am indebted to the Applied Research Branch of Human Resources Development Canada and Statistics Canada for making available the results on *Who Am I?* from the North York community study and the five Community 2000 studies, undertaken as a part of the Understanding the Early Years initiative. I am particularly grateful to Dr. Satya Brink, Director, Child, Youth and Social Development Studies in the Applied Research Branch of Human Resources Development Canada, for her interest in and support of the work on *Who Am I?*, and to Liz Nieman, in the same Branch, and Stephanie Lalonde and Ghysline Forget, of Statistics Canada, for keeping me informed of the ongoing work relating to the use of *Who Am I?* in the Canadian community studies and in the National Longitudinal Survey of Children and Youth.

I appreciated the opportunity to present material from this paper at Applied Research Branch's national dialogue conference, Ready, Set, Go! Improving the Odds Through Integrated Research, Policy and Practice, in February 2002.

Table of Contents

1. Introduction 1

2. Context of the Study 3

3. Cross Cultural Data on *Who Am I?* 4

3.1 The Samples 4

3.2 Age-Matched School Levels 5

3.2.1 Comparison of Mean Scores on *Who Am I?*
3.2.2 Summary of Comparisons by Age-Matched Levels

3.3 Levels Matched by Year of Early Schooling (School-Matched Levels) 11

4. Descriptive Results 15

5. Factors Related to Performance on the *Who Am I?* Tasks 18

5.1 Age and Schooling Effects 18

5.1.1 Gender
5.1.2 Preschool Experience

5.2 Language and Home-Background Variables 21

5.2.1 Differential Effects of Language Background on Language Tests and *Who Am I?*

6. Use of *Who Am I?* for the Identification of Children "At Risk" 25

6.1 Applying an Absolute Criterion of "At Risk" 25

6.2 Applying a Relative Criterion of "At Risk" 26

6.3 Accuracy of *Who Am I?* as a Screening Measure 27

7. Issues Relating to Administration and Scoring of *Who Am I?* 30

7.1 No Attempt Responses 30

7.2 Scoring 31

8. Conclusion 32

Appendix Background and Technical Information on *Who Am I?* 35

Bibliography 41

1. Introduction

Children all over the world start school at about the age of five or six years. This age is associated with what has been called the "five to seven year shift," when children are seen as being ready to take on more responsible tasks, and to be capable of more formal learning. Even in those societies where children do not attend formal school, it is at about age six that children are expected to take on more responsible tasks, such as taking care of younger children, tending animals and performing household chores (Sameroff and Haith, 1996). This shift has also been described as the age of reason, or the point at which children are capable of more rational thought, and are, therefore, teachable (White, 1996). In Piagetian terms, this shift corresponds with the transition from intuitive to concrete operational thinking, which is dependent on an internal restructuring which enables the child to coordinate different perspectives simultaneously rather than to focus on only one aspect of a situation at a time. This marks the beginning of logical thought and reasoning ability, based on the internal conceptualisation of ideas and concepts which can be abstracted from a specific situation and generalised to other contexts. While there is continuing debate as to the processes underlying this shift, there is nevertheless general agreement that there is a fundamental change in children's thinking that takes place somewhere between the ages of five and seven years.

Whether this shift in thinking between five and seven years is a consequence of schooling, rather than a basis for schooling, remains unresolved. Recent research on the relative effects of age and schooling indicate that some language and conceptual skills are more closely related to age than to schooling, while other language and conceptual skills are more closely related to schooling than to age (Morrison, Griffith and Frazier, 1996). This suggests that both development and learning play a part in developing the skills that mark the transition that occurs at age five to seven.

An example of the interactive role of development and learning in the achievement of school-related skills is illustrated by the acquisition of reading. Most children learn to read between the ages of five and seven. But while the ability to read is dependent on a number of underlying skills that are linked with development, the acquisition of reading is, in most cases, not achieved without formal or specific instruction in reading. Thus, both development and learning are necessary in achieving this skill.

While there are differences in children's cultural and social experiences across different countries and social groups, there are, nevertheless, commonalities in development that seem to be associated with underlying developmental processes. Speech is common to all cultures, and children require only exposure to the spoken language through social interaction to acquire competence in the use of oral language. The use of drawings or symbols to represent objects or words is also a common characteristic of human societies, although not all societies have developed a written language. Nevertheless, research has demonstrated a developmental progression in children's ability to draw a human figure, to copy geometrical forms, and to write numbers and letters. This progression follows the same developmental pattern across different cultures. Since these are aspects of behaviour that can be assessed independently of the child's particular language or cultural background, they provide a basis for examining children's developmental progression across different cultural groups. And since copying and writing provide the essential tools for school learning, both in terms of learning to read and write and in terms of providing the notation system underlying numerical and mathematical concepts, they also provide a measure of children's readiness to learn, in the sense of being ready for more formal schooling. It is in this context that *Who Am I?* has been used to assess children's developmental level and their readiness for more formal learning experiences, and to examine patterns of development across different cultural groups.

2. Context of the Study

Who Am I? was developed for use in a research study undertaken by the Australian Council for Educational Research (ACER) in 1998. It is based on a series of copying and writing tasks which identify the level that children have reached in their understanding and use of conventional symbols, and is designed to tap the broad stages of development that underlie a child's readiness for particular types of learning experiences. Subsequently, data on *Who Am I?* were collected from samples of children in Hong Kong, India and Sweden.

In Canada, *Who Am I?* has been used in a number of communities participating in the national initiative on Understanding the Early Years, as well as in the fourth cycle of the Canadian National Longitudinal Survey of Children and Youth. Its purpose in these studies is to provide one of three direct measures of children's early learning and development, which can be used as a basis for examining the association between patterns of early development and learning and various community and family factors which may be associated with early development, and which may affect children's subsequent success in school and in other life experiences.

The Canadian data on *Who Am I?*, together with data from the Australian study and the other cross-cultural samples, provide a basis for examining patterns of development across different cultural groups, where there is variation in both the age of entry to school and in the nature of educational provision prior to entry to school. Differences in these patterns of development provide some insights into the extent to which variations in development are associated with particular aspects of the children's cultural and school experiences in the years prior to entry to school.

A more detailed description of the development of *Who Am I?* and the tasks that are included in the assessment, as well as the theoretical rationale on which the instrument is based and technical information relating to its validity and reliability, is provided in the Appendix to this paper.

3. Cross Cultural Data on *Who Am I?*

3.1 The Samples

The samples on which data on *Who Am I?* are available include the initial Australian sample of over 4000 Australian children from preschool to Year 2, ranging in age from four to over seven years, together with the data from samples in Canada, Hong Kong, India and Sweden.

Canadian data on *Who Am I?* are available from two samples which are part of Canada's Understanding the Early Years initiative. The first sample comprises 687 children at senior kindergarten level, the year prior to entry to formal schooling, drawn from the North York community in Ontario, now incorporated into the new city of Toronto as the North Quadrant. This community is both ethnically and culturally diverse, with a large immigrant population and many children from language backgrounds other than English or French. These data were collected in 1999. The second sample comprises 2128 children drawn from five communities across the country (Southwest Newfoundland; Prince Edward Island; Winnipeg District I, Manitoba; Prince Albert, Saskatchewan; and Coquitlam, British Columbia). These children were drawn from a mixed range of backgrounds, including urban and rural populations, and were assessed in 2000, at the end of their senior kindergarten year. This sample is referred to as the Community 2000 sample elsewhere in this report. In the case of the Canadian samples, not all the *Who Am I?* items were administered. For this reason, the comparisons between the different samples were based only on the items on the Copying and Symbols Scales, which were included in the Community 2000 studies data set. In the case of the North York community, the name item from the Symbols Scale was not administered, and this sample was not, therefore, included in the cross-cultural comparisons.

The Hong Kong data on *Who Am I?* are based on a sample of 60 preschool children drawn from three levels of preschool, assessed in June 1999. The children were all of Chinese origin and from Cantonese-speaking homes, and were aged from four to seven years. The assessments were undertaken by the children's preschool teachers in Cantonese, and the children's responses included responses in both English and Chinese. The responses were scored at ACER, with the responses in Chinese being scored by a senior researcher at ACER, who was also a native speaker of Mandarin. In scoring these responses, it was possible to apply the general principles of the scoring criteria to allocate the responses

in both English and Chinese to one of the four score levels identified (Mellor and Leung, 2000, de Lemos, 2000).

The Indian data on *Who Am I?* were collected in 1999 as part of an evaluation of an intervention study designed to extend the provision of early childhood education to children from economically weaker families living under difficult geographic conditions. The study was undertaken in a remote area of Northern India, in the small hill state of Himachal Pradesh. *Who Am I?* was used in the context of this study to collect information on the developmental level and early literacy and numeracy skills of Grade 1 children at the beginning of their first term of school. The sample comprised a total of 232 children who were assessed on *Who Am I?* at the beginning of Grade 1 (Sood, 2001).

Swedish data on *Who Am I?* were collected to compare the progress of children in a system where children entered school at a later age (age 7), and where there was little emphasis on the teaching of the formal skills of reading and writing at the preschool level. The Swedish sample comprised a total of 91 children, 58 six-year-olds in a preschool class attached to a primary school, and 33 five-year-olds in preschool, who were assessed at the end of the school year in May 2001.[1]

3.2 Age-Matched School Levels

Comparisons between these different samples is complicated by the different age ranges and the different levels of schooling of the groups assessed. In order to overcome these difficulties, it was decided to identify different levels of schooling (including preschooling), based on the average age, or age range, of the children at each of the levels identified in their own school system. This resulted in the identification of four age-matched levels of schooling, covering age four, age five, age six and age seven. The allocation of each sample according to these school levels is shown in Table 1.

[1] Unpublished data provided by Professor Gunilla Fredriksson, of Linkopings University, Sweden.

Table 1 **Age-Matched Levels of Schooling: Australia, Canada, Sweden, India and Hong Kong**

Age-Matched School Levels	Approx. Mean Age	Australia	Canada	Sweden	India	Hong Kong
School Level 1	4:0					End First Year of Preschool N = 15 Age = 4:1 (3:4 – 4:6)
School Level 2	5:0	Mid Preschool N = 855 Age = 4:11 (3:4 - 6:5)				End Second Year of Preschool N = 25 Age = 4:11 (4:4 – 5:8)
School Level 3	6:0	Mid First Year N = 1353 Age = 5:11 (4:7-7:6)	End Senior Kindergarten N = 687 + 2128 Age = 6:0 (5:1-7:11)	End Preschool N = 33 Age=5:11 (5:1 – 6:8)	Beginning Grade 1 N = 232 Age = 5:9 (4:0 – 6:8)	End Third Year of Preschool N = 20 Age = 6:0 (5:5 – 6:4)
School Level 4	7:0	Mid Second Year N = 1222 Age = 6:10 (5:7-8:6)		End Preschool Class N = 58 Age=6:10 (6:2-7:4)		

From Table 1, it can be seen that the only group at the first (four-year-old) school level was the youngest group of preschool children in Hong Kong, who were in their first year of preschool. The average age of this group at the end of their preschool year was 4:1.

There were two groups at the second (five-year-old) school level. These were the group of Hong Kong children who were in their second year of preschool (average age of 4:11 at the end of the preschool year) and the Australian preschool group assessed in the middle of their preschool year. While this group included a fairly wide age range, most were aged between four and five, with an average age of 4:11.

The third school level included children from all of the cross-cultural samples, who were either at the end of their preschool year or in the first half of their first year at school. The only exception to this was Sweden, where the children at this school level were at the end of their first year of preschool. The average age of the children in all of these groups was just on or just below six years (5:9 to 6:0). This group may, therefore, be seen as comprising the "entry to school group," who have either just started or are just about to start formal schooling. It is this group that will form the basis for most of the comparisons across the different samples.

The fourth school level included the Australian group in the middle of their second year of school, and the Swedish group at the end of their final year of preschool. The average age of both these groups was just under seven years (6:10). Comparison of these two groups is of interest in terms of looking at the developmental levels of children who are of the same age and come from similar kinds of societies with high levels of parental education and income, but have had different exposure to formal teaching of early literacy and numeracy skills.

3.2.1 Comparison of Mean Scores on *Who Am I?*

A comparison of mean scores on *Who Am I?* across these various age-matched groups is shown in Tables 2 to 4. Scores are shown separately for the Copying Scale and the Symbols Scale, as well as for the total score on the Copying plus the Symbols Scales. The maximum score on each of the Copying and Symbols Scales was 20, while the maximum total score on the two scales combined was 40. For the purpose of these comparisons, scores on the drawing task, which was not included in the Canadian data collection, have been excluded. The Canadian data is based only on the groups included in the Community 2000 studies, where all tasks on the Copying and Symbols Scales of *Who Am I?* were included in the assessment.

These results indicate that when compared with the other samples, the scores of the Canadian children at the end of their Senior Kindergarten year are, in general, comparable with the scores of the Australian group in their first year of schooling. While the mean age of these two groups is similar, the Canadian children are not yet in a formal school program, while the Australian children have already spent four to five months in a full-time school program.

The mean score of the Swedish children at the same age-matched level, who are in their first year of a preschool program, is similar to that of the Canadian and Australian children of the same age on the Copying tasks, but the Swedish children at this age are doing less well on the Symbols tasks. However, by the end of their second year in preschool, the Swedish children are catching up with their Australian age peers, who are already in their second year of schooling.

Children in Hong Kong are scoring at a consistently higher level than children of the same age in the other samples on both the Copying Scale and the Symbols Scale. On the other hand, children in India, at the beginning of their first year of school, are scoring at a consistently lower level than their age-matched peers on both the Copying and the Symbols Scales.

Table 2 **Mean Scores on Copying Scale, by Age-Matched School Levels (AM Level)***

Age-Matched Level	Approx. Mean Age	Australia	Canada	Sweden	India	Hong Kong
AM Level 1	4.0					12.9
AM Level 2	5.0	13.5				16.1
AM Level 3	6.0	16.1	15.6	15.7	13.3	17.7
AM Level 4	7.0	17.5		18.0		

* Shaded cells indicate preschool levels. Non-shaded cells indicate school levels.

Table 3 **Mean Scores on Symbols Scale, by Age-Matched School Levels (AM Level)***

Age-Matched Level	Approx. Mean Age	Australia	Canada	Sweden	India	Hong Kong
AM Level 1	4:0					10.3
AM Level 2	5:0	9.8				16.0
AM Level 3	6.0	15.7	14.9	12.9	12.1	19.8
AM Level 4	7.0	19.0		17.0		

* Shaded cells indicate preschool levels. Non-shaded cells indicate school levels.

Table 4 **Mean Scores on Copying Plus Symbols Scales, by Age-Matched School Levels (AM Level)***

Age-Matched Level	Approx. Mean Age	Australia	Canada	Sweden	India	Hong Kong
AM Level 1	4:0					23.1
AM Level 2	5:0	23.3				32.1
AM Level 3	6:0	31.9	30.5	28.6	25.4	37.5
AM Level 4	7:0	36.5		35.0		

* Shaded cells indicate preschool levels. Non-shaded cells indicate school levels.

In the case of those samples which include more than one level of schooling, there is a clear progression in score from one level to the next. This is illustrated graphically in Figure 1, where mean scores have been plotted separately for the younger and older six-month age group within each age-matched school level. These graphs indicate that there is a consistent increase in score from one school level to the next, but that the increase in score from one six-month age group to the next six-month age group is more marked across school levels than within school levels. This trend is particularly evident in the case of the Hong Kong sample, where there is relatively little increase in score according to age within each school level, but a marked increase in score from one school level to the next.

Table 2 **Mean Scores on Copying Scale, by Age-Matched School Levels (AM Level)***

Age-Matched Level	Approx. Mean Age	Australia	Canada	Sweden	India	Hong Kong
AM Level 1	4 0					12.9
AM Level 2	5 0	13.5				16.1
AM Level 3	6 0	16.1	15 6	15.7	13.3	17.7
AM Level 4	7 0	17 5		18.0		

* Shaded cells indicate preschool levels. Non-shaded cells indicate school levels.

Table 3 **Mean Scores on Symbols Scale, by Age-Matched School Levels (AM Level)***

Age-Matched Level	Approx. Mean Age	Australia	Canada	Sweden	India	Hong Kong
AM Level 1	4 0					10.3
AM Level 2	5.0	9 8				16.0
AM Level 3	6 0	15 7	14 9	12.9	12 1	19.8
AM Level 4	7 0	19 0		17.0		

* Shaded cells indicate preschool levels. Non-shaded cells indicate school levels.

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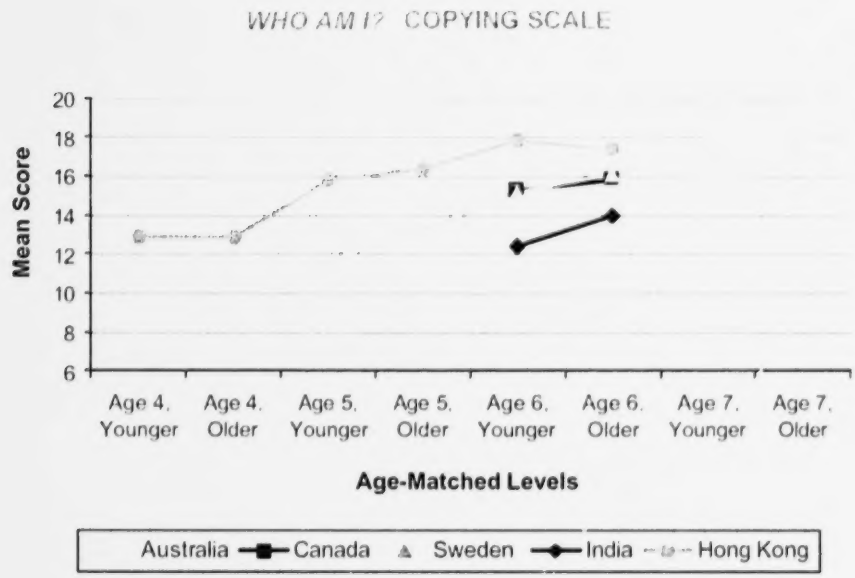
Figure 1 **Mean Scores on *Who Am I*? Copying and Symbols Scales, for Age-Matched Levels**



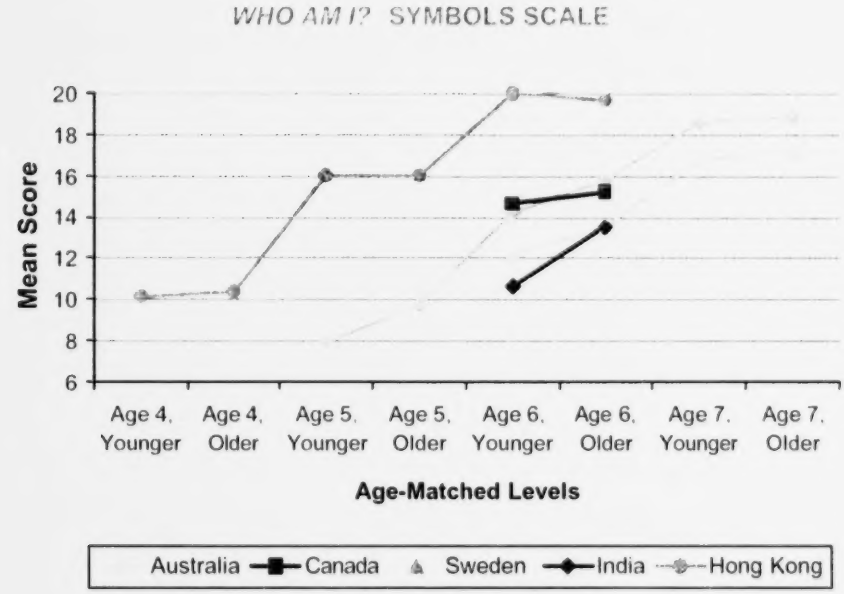
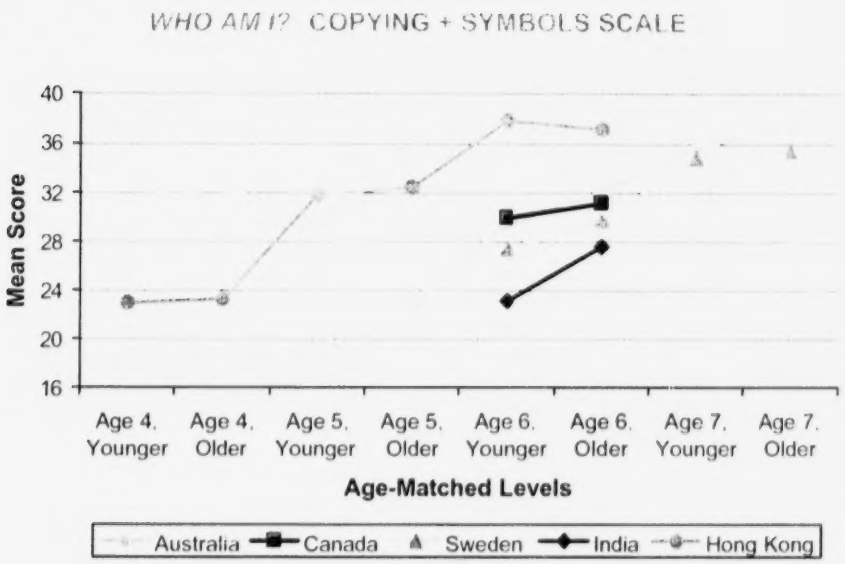


Figure 1 (Continued)



3.2.2 Summary of Comparisons by Age-Matched Levels

These comparisons of mean scores on the Copying and Symbols Scales across the different cross-cultural samples at age-matched school levels indicate some consistencies in development according to age, regardless of variations in the nature of the children's preschool and school experiences, both in terms of the number of years of early schooling and in terms of the nature of the school program (that *is*, a preschool versus a school program). On the other hand, there are also differences, particularly on the Symbols Scale, which seem to be associated with schooling effects.

The reason for the accelerated development in the case of the Hong Kong children is likely to be related both to the length of their exposure to a preschool program (three years, commencing at age three) and to the nature of the preschool program, where there is an emphasis on formal learning, and children are expected to be able to recognise and write some simple characters and words by the end of their last year in preschool (Mellor, Frederiksson and Leung, 2001). Similarly, the lag in development in the case of the Swedish children, particularly on the Symbols Scale, is likely to be related to the greater emphasis on learning through play in Swedish preschools, and the corresponding lack of emphasis on the development of formal reading and writing skills. This reflects a different set of teacher values and parental expectations with regard to what are considered to be appropriate learning experiences for

children at preschool level in Sweden as compared with Hong Kong. In the case of the Indian sample, both home and schooling factors are likely to have contributed to the lower scores, since most of the children in this sample came from relatively poor home backgrounds, and less than half had attended preschool prior to entry to school.

The difference between Australian seven-year-old children in their second year of school as compared with Swedish children of the same age, who are still in preschool, is relatively small, considering the difference in exposure to formal schooling. This suggests that an age factor, independent of formal schooling effects, is also associated with performance on the *Who Am I?* tasks. However, in the case of the Swedish sample, it is likely that informal learning in the home was also a factor contributing to the children's development. As noted by Lundberg (1999), there has been a long tradition of literacy in Sweden, and, even in pre-industrial times before schooling became compulsory, it was expected that everyone should be able to read and write. Thus, in Sweden, the high value placed on literacy and the tradition for learning to read at home, together with the exposure to books and early literacy experiences in the home, would provide a basis for the acquisition of early literacy skills independently of formal teaching at preschool level.

Home factors are also likely to have contributed to the relatively poorer performance of the Indian sample of six-year-olds in their first year of school, since most of the children in this sample came from relatively poor home backgrounds where the parents had had little schooling and were generally unable to read or write. In such cases, the children would have had little exposure to books or reading in the home, and little opportunity to develop early literacy skills or to become familiar with the letters and symbols that provide the basis for the written language.

3.3 Levels Matched by Year of Early Schooling (School-Matched Levels)

The comparisons by age-matched levels across the different samples indicated that performance on *Who Am I?* was related to both age and schooling. For this reason it was decided to look at mean scores across the different samples according to year of early schooling, regardless of whether this "schooling" was provided in a preschool program or in a first year of school program.

The results of this comparison are shown in Tables 5 to 7. The column headings indicate the preschool (PS) or school year (SY) corresponding to each level of early schooling in each sample. The approximate age of the children at each level is also shown. In the case of the Canadian sample, the senior kindergarten year (SK) is placed at the second level, assuming that the first level is the junior kindergarten year or a preschool program prior to entry to senior kindergarten.[2] Not all children in India attend preschool (PS) in the year prior to entry to Grade 1, so for the purposes of this comparison, the Indian sample was divided into two groups. Those who had attended preschool in the year prior to entry to school were assumed to be at the second level of schooling, while those who had not attended preschool in the year prior to entry to Grade 1 were assumed to be at the first level of schooling.

Table 5 **Mean Scores on Copying Scale, by School-Matched Levels ***

School-Matched Level	Australia PS**=5:0 SY1** =6:0 SY2** =7:0	Canada*** SK**=6:0	Sweden PS1**=6:0 PS2**=7:0	India, Grade 1 No PS**=6:0 With PS**=6:0	Hong Kong PS1**=4:0 PS2**=5:0 PS3**=6:0
SM Level 1	13.5		15.7	12.7	12.9
SM Level 2	16.1	15.6	18.0	14.1	16.1
SM Level 3	17.5				17.7

* Shaded cells indicate preschool levels. Non-shaded cells indicate school levels.
** PS = preschool, SY = school year, SK = senior kindergarten.
*** Depending on the province, children in the Canadian sample may have attended preschool or junior kindergarten prior to attending senior kindergarten.

Table 6 **Mean Scores on Symbols Scale, by School-Matched Levels***

School-Matched Level	Australia PS**=5:0 SY1** =6:0 SY2** =7:0	Canada*** SK**=6:0	Sweden PS1**=6:0 PS2**=7:0	India, Grade 1 No PS**=6:0 With PS**=6:0	Hong Kong PS1**=4:0 PS2**=5:0 PS3**=6:0
SM Level 1	9.8		12.9	11.4	10.3
SM Level 2	15.7	14.9	17.0	13.2	16.0
SMLevel 3	19.0				19.8

* Shaded cells indicate preschool levels. Non-shaded cells indicate school levels.
** PS = preschool, SY = school year, SK = senior kindergarten.
***Depending on the province, children in the Canadian sample may have attended preschool or junior kindergarten prior to attending senior kindergarten.

[2] In Canada, not all children in senior kindergarten will have attended junior kindergarten or preschool, although many will have. Junior kindergarten is not available in most provinces and is not mandatory. Preschool programs are provided by various types of organizations, for a fee, and are not universally available.

Table 7 **Mean Scores on Copying Plus Symbols Scales, by School-Matched Levels***

School-Matched Level	Australia PS**=5:0 SY1** =6:0 SY2** =7:0	Canada*** SK**=6:0	Sweden PS1**=6:0 PS2**=7:0	India, Grade 1 No PS**=6:0 With PS**=6:0	Hong Kong PS1**=4:0 PS2**=5:0 PS3**=6:0
SM Level 1	23.3		28.6	25.8	23.1
SM Level 2	31.9	30.5	35.0	29.4	32.1
SM Level 3	36.5				37.5

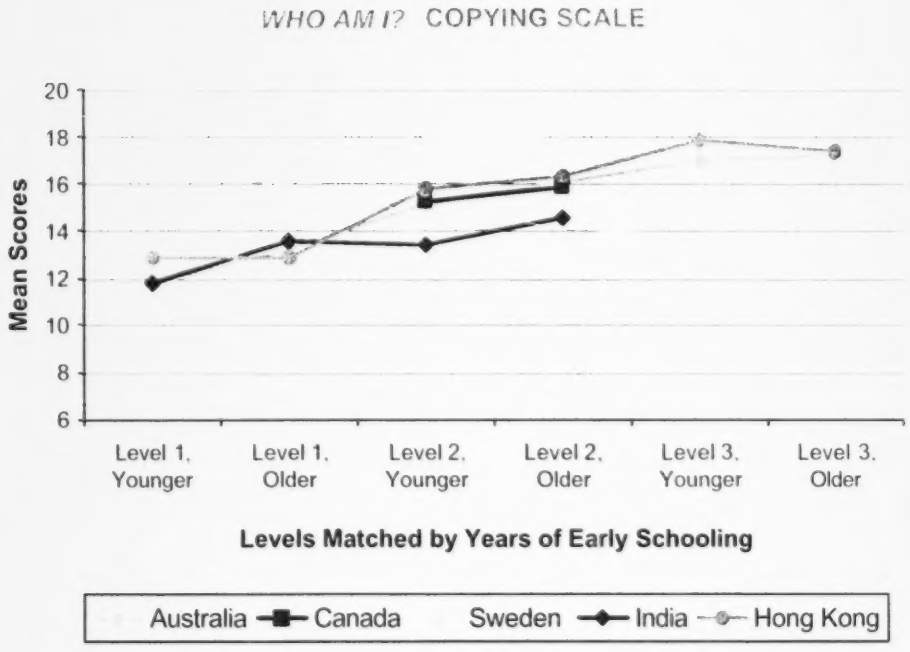
* Shaded cells indicate preschool levels. Non-shaded cells indicate school levels.

** PS = preschool, SY = school year, SK = senior kindergarten.

***Depending on the province, children in the Canadian sample may have attended preschool or junior kindergarten prior to attending senior kindergarten.

While there is still variation between the samples matched by school level according to the age of the children at corresponding school matched levels, the variation in mean scores for children at the same school-matched level is generally less marked than in the case of age-matched levels, particularly for children at the second level of schooling (see Figure 2 for a graphical presentation of these results). This indicates that exposure to an early years of school program, whether in a preschool or a school setting, has an effect on the development of the skills assessed by *Who Am I?*, over and above the effects of age.

Figure 2 **Mean Scores on *Who Am I?* Copying and Symbols Scales, Levels Matched by Years of Early Schooling**



The results of this comparison are shown in Tables 5 to 7. The column headings indicate the preschool (PS) or school year (SY) corresponding to each level of early schooling in each sample. The approximate age of the children at each level is also shown. In the case of the Canadian sample, the senior kindergarten year (SK) is placed at the second level, assuming that the first level is the junior kindergarten year or a preschool program prior to entry to senior kindergarten.[2] Not all children in India attend preschool (PS) in the year prior to entry to Grade 1, so for the purposes of this comparison, the Indian sample was divided into two groups. Those who had attended preschool in the year prior to entry to school were assumed to be at the second level of schooling, while those who had not attended preschool in the year prior to entry to Grade 1 were assumed to be at the first level of schooling.

Table 5 **Mean Scores on Copying Scale, by School-Matched Levels ***

School-Matched Level	Australia PS**=5:0 SY1** =6:0 SY2** =7:0	Canada*** SK**=6:0	Sweden PS1**=6:0 PS2**=7:0	India, Grade 1 No PS**=6:0 With PS**=6:0	Hong Kong PS1**=4:0 PS2**=5:0 PS3**=6:0
SM Level 1	13.5		15.7	12.7	12.9
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* Shaded cells indicate preschool levels. Non-shaded cells indicate school levels.
** PS = preschool, SY = school year, SK = senior kindergarten.
*** Depending on the province, children in the Canadian sample may have attended preschool or junior kindergarten prior to attending senior kindergarten.

Table 6 **Mean Scores on Symbols Scale, by School-Matched Levels***

School-Matched Level	Australia PS**=5:0 SY1** =6:0 SY2** =7:0	Canada*** SK**=6:0	Sweden PS1**=6:0 PS2**=7:0	India, Grade 1 No PS**=6:0 With PS**=6:0	Hong Kong PS1**=4:0 PS2**=5:0 PS3**=6:0
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* Shaded cells indicate preschool levels. Non-shaded cells indicate school levels.
** PS = preschool, SY = school year, SK = senior kindergarten.
***Depending on the province, children in the Canadian sample may have attended preschool or junior kindergarten prior to attending senior kindergarten.

[2] In Canada, not all children in senior kindergarten will have attended junior kindergarten or preschool, although many will have. Junior kindergarten is not available in most provinces and is not mandatory. Preschool programs are provided by various types of organizations, for a fee, and are not universally available.

Table 7 **Mean Scores on Copying Plus Symbols Scales, by School-Matched Levels***

School-Matched Level	Australia PS**=5:0 SY1** =6:0 SY2** =7:0	Canada*** SK**=6:0	Sweden PS1**=6:0 PS2**=7:0	India, Grade 1 No PS**=6:0 With PS**=6:0	Hong Kong PS1**=4:0 PS2**=5:0 PS3**=6:0
SM Level 1	23.3		28.6	25.8	23.1
SM Level 2	31.9	30.5	35.0	29.4	32.1
SM Level 3	36.5				37.5

* Shaded cells indicate preschool levels. Non-shaded cells indicate school levels.

** PS = preschool, SY = school year, SK = senior kindergarten.

*** Depending on the province, children in the Canadian sample may have attended preschool or junior kindergarten prior to attending senior kindergarten.

While there is still variation between the samples matched by school level according to the age of the children at corresponding school matched levels, the variation in mean scores for children at the same school-matched level is generally less marked than in the case of age-matched levels, particularly for children at the second level of schooling (see Figure 2 for a graphical presentation of these results). This indicates that exposure to an early years of school program, whether in a preschool or a school setting, has an effect on the development of the skills assessed by *Who Am I?*, over and above the effects of age.

Figure 2 **Mean Scores on *Who Am I?* Copying and Symbols Scales, Levels Matched by Years of Early Schooling**

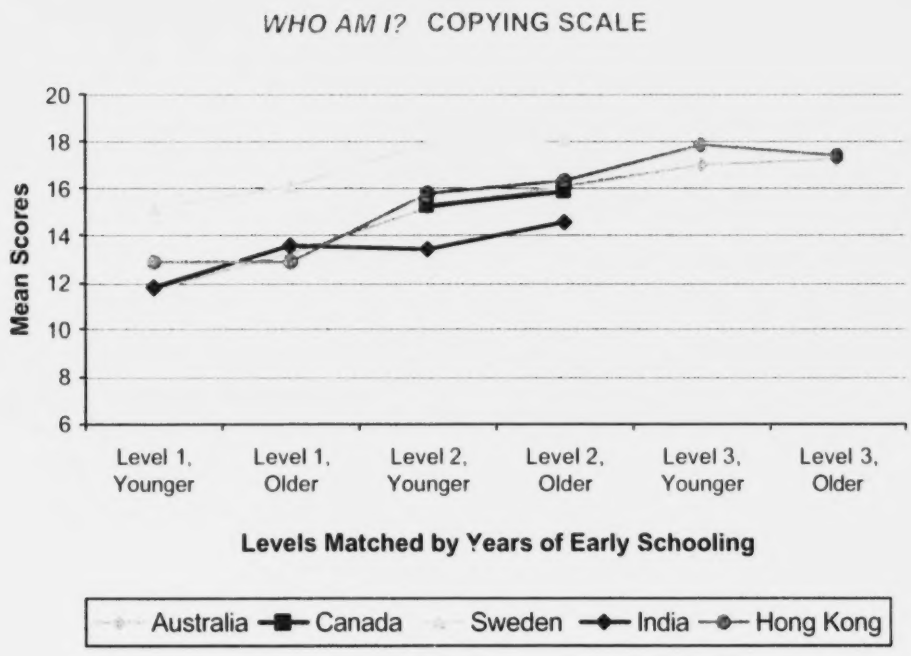
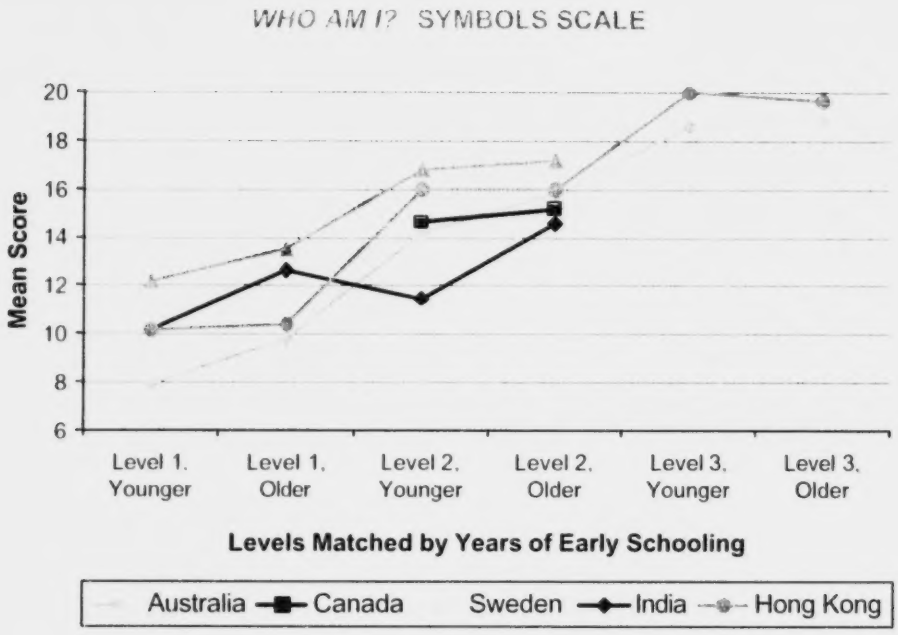
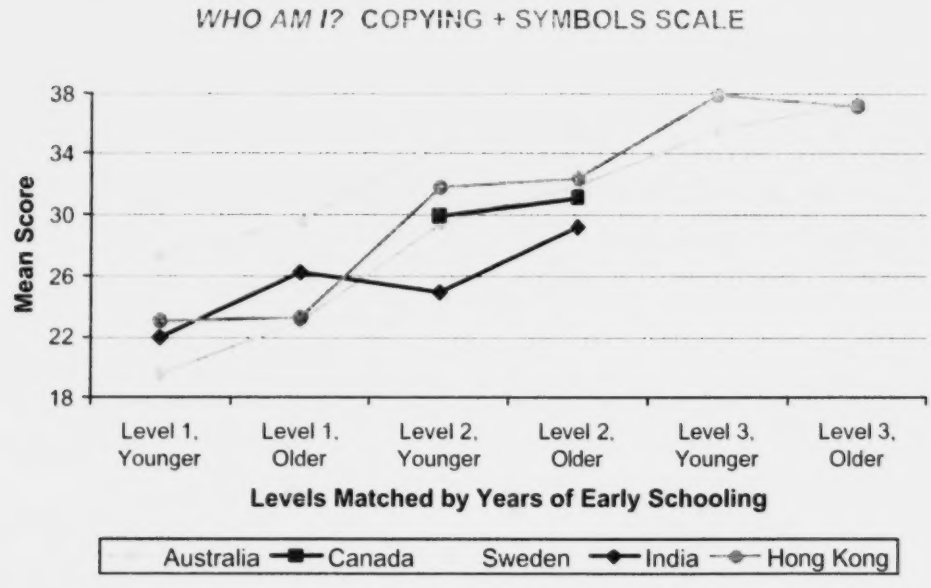


Figure 2 (Continued)





4. Descriptive Results

Comparison of mean scores on the different scales of *Who Am I?* provide information on the relative performance of children at different age-matched levels. However, they do not indicate what these differences mean in real terms.

To obtain a more descriptive analysis of the skills children have actually achieved, a further analysis of the children's level of development was undertaken, based on the developmental stages achieved on each of the Symbols tasks and the Diamond task. These tasks were selected as the tasks which were most indicative of the children's developmental level.

Responses on each of these tasks were allocated a score ranging from 1 to 4, depending on a qualitative assessment as to the developmental level indicated by the child's response. For all tasks, a score of 1 or 2 indicated that the child was not yet able to respond appropriately to the task. A score of 3 or 4 indicated either a successful or a partially successful response to the task, indicating at least some understanding of the requirement of the task and a reasonable attempt to complete the task.

Table 8 shows the percentage of responses indicating success or partial success on each task (level 3 and level 4 responses) for the different samples at entry to school level (age five to six years) on the Symbols items of *Who Am I?*, the Diamond task on the Copying Scale, and the Drawing task, in the case of those samples where this task was administered.

Results on the diamond copying task have been included in this analysis because this item was found to be the most discriminating item on the Copying Scale. In addition, success on this task has been found to be associated with the transition to the concrete operational stage of development (Piaget and Inhelder, 1956). Success (or partial success) on this task may, therefore, be taken as an indicator of developmental level, and of the developmental shift that occurs somewhere between the age of five and seven years. Results on the drawing task are also shown in Table 8. Although this task was not administered to the Canadian Community 2000 sample, and, therefore, not included in the calculation of the overall mean score on *Who Am I?*, this task does provide further information on developmental level, and, therefore, supplements the information provided by the other tasks.

Table 8 **Percentage of Level 3 and Level 4 Responses on Selected Tasks, by Country, for School Entry Level (Age 6)**

Task	Australia Mid First Year of Schooling 5:11 1355	Canada 2000 End Senior Kindergarten 6:0 N=2128	Sweden End Preschool Level 1 5:11 N = 33	Hong Kong End Preschool Level 3 6:0 N = 20	India Beginning Grade 1 5:9 N = 232
Diamond	74	74	55	100	19
Name	95	95	91	100	40
Numbers	90	79	49	95	89
Letters	92	86	82	100	78
Words	64	50	27	100	17
Sentence	44	36	9	100	6
Drawing	84	N/C	52	70	10

N/C: not collected

The results of the different samples on the diamond copying task indicate that by the time they start school, most children in Australia, Canada and Hong Kong are able to copy the diamond, or at least to make a reasonable attempt to represent the main features of the figure. However, only about half of the six-year old children in Sweden (at the end of their first year in preschool) and one fifth of the children in India (at the beginning of their first year in school) are able to complete this task. This suggests that the achievement of this skill is related not only to age, but also to the kinds of experiences that children are exposed to in their preschool years.

At age six, most children are able to write their own name (except in the case of the Indian sample), and most are also able to write numbers and letters. However, the Swedish group at this age level still seems to have some difficulty with numbers, with only 49 per cent achieving success or partial success on this task. While all of the Hong Kong six-year olds are able to write words and a sentence, children in the other samples are less advanced in their writing skills. In Australia and Canada, about half of the children are able to write at least some words, but only about 30 to 40 per cent are able to write a sentence. Six-year-olds in Sweden and India have less developed writing skills, with only 20 to 30 per cent of children being able to write some words, and less than 10 per cent being able to write a sentence.

The responses to the drawing task support the overall pattern of results on the other tasks, but, nevertheless, reveal some differences that are of interest to note. Despite their success on the other tasks, relatively fewer of the children in Hong King achieve a level 3 or level 4 response on this task (70 per cent). This suggests that, in some cases, the effects of a highly structured teaching program may result in an apparent discrepancy between achieved skills and developmental level. It is also of interest to note the correspondence between lower scores on the diamond task and lower scores on the

drawing task in the Swedish and Indian samples. This correspondence gives some support to the assumption that both these tasks are tapping underlying developmental processes, but that these processes are associated not only with age but also with exposure to particular types of preschool experience.

Whether these variations in response patterns among the different items reflect real differences in relative performance on the different tasks, or whether they are due, at least in part, to differences in the way the scoring criteria have been applied in scoring the responses, is an issue which will need to be considered further. Nevertheless, there is an overall consistency in trends and patterns which suggest that *Who Am I?* is providing a valid indicator of development and learning in children from age four to age seven. This measure is sensitive to variations not only in age, but also in the nature of the educational program provided for children in the years prior to entry to school, and to parent and teacher expectations and family background characteristics that are likely to have an impact on children's early development and learning.

5. Factors Related to Performance on the *Who Am I?* Tasks

5.1 Age and Schooling Effects

Results on *Who Am I?* indicate an increase in score with both age and level of schooling. However, these two factors are so closely correlated that it is difficult to determine the effect of schooling independent of the effect of age.

One way of looking at the relative effects of age and schooling is to examine the increase in score by six-month age groups within a school level, as compared with the increase in score in the case of adjacent six-month age groups across two different levels of schooling. In this case, the age difference between the two groups is the same, but the one comparison is between groups differing only in age, while the other comparison is between groups differing in both age and schooling. For each of the achievement measures used in the study, results are reported in terms of mean standardised scores, together with the results of the tests of significance applied and the effect sizes.[3]

Table 9 provides a summary of the differences in mean scores on both the Copying and Symbols Scales according to relative age within a school level, as compared with differences in mean scores across school levels, where the age difference is similar to the age difference within a school level. Differences in relative age within a school level were calculated for all the samples at all school levels, while differences between adjacent age groups across two levels of schooling were calculated only for those samples that included groups at more than one school level. Differences are in all cases expressed in the form of effect sizes.

[3] Effect sizes provide a measure of the difference in mean score between two groups expressed in terms of standard deviation units. They are, therefore, comparable across different studies regardless of the actual unit of measurement, and are commonly used to compare results across different studies, as, for example, in meta-analyses. Effect sizes are calculated by subtracting the mean raw score of the first group (the control or reference group) from the mean raw score of the second group (the experimental or comparison group), and dividing this difference by the standard deviation of the control (or reference) group, or by the standard deviation of the total sample (Cohen, 1969). Positive effect sizes, therefore, indicate higher scores for the experimental or comparison group, while negative effect sizes indicate higher scores for the control or reference group. In the case of the comparisons based on relative age, positive effect sizes indicate that the scores of the older age group are higher than the scores of the younger age group, while negative effect sizes indicate that the scores of the younger age group are higher than the scores of the older age group. Following Cohen (1969), an effect size of .20 is interpreted as a small effect, an effect size of .50 is interpreted as a moderate effect, and an effect size of .80 is interpreted as a large effect.

Table 9 **Effect Sizes of Differences in Mean Scores for Relative Age Within and Across School Levels: Copying and Symbols Scales**

Sample	Within Level	Mean Age	Across Levels	Copying		Symbols	
				Within	*Across*	*Within*	*Across*
Australia	Mid PS*	4:11		.46		.62	
Australia	SY1*	5:11	PS*/SY1*	.40	.56	.56	1.51
Australia	SY2*	6:10	SY1/SY2*	.34	.36	.30	.95
Australia	SY3*	7:70	SY2/SY3*	.16		.10	
Canada (NY)	SK*	6:00		.26		.29	
Canada (2000)	SK*	6:00		.24		.17	
India	Grade 1	5:90		.51		.80	
Hong Kong	PS1*	4:10		.01		.10	
Hong Kong	PS2*	4:11	PS1*/PS2*	.31	1.67	.00	2.20
Hong Kong	PS3*	6:00	PS2*/PS3*	-.39	.65	-.47	1.44
Sweden	PS1*	5:11		.30		.35	
Sweden	PS2*	6:10	PS1*/PS2*	.12	.56	.16	1.28

* PS = preschool, SY = school year, SK = senior kindergarten

From Table 9, it can be seen that differences according to relative age within a school level vary somewhat between the various sample groups, but are in general higher at the younger age levels than at the older age levels. An exception to this pattern is Hong Kong, where there is no consistent increase in score with age within a school level, and in fact a negative effect in the third year of preschool, where the younger children are performing at a slightly higher level than the older children. A possible explanation for the lack of relative age effects in the Hong Kong sample is that the schooling effect is so strong that it overcomes the age effect. However, the sample sizes in this group are too small to draw any firm conclusion from these results.

The effect sizes for differences between adjacent age levels across school levels are, in most cases, substantially higher than the effect sizes for relative age within a school level, indicating that school level has a substantial effect on performance over and above the effect that can be attributed to the age difference. These differences tend to be higher for the Symbols Scale than for the Copying Scale, with effect sizes ranging from .36 to 1.67 in the case of the Copying Scale, and from .95 to 2.2 in the case of the Symbols Scale. These effect sizes indicate substantial and educationally significant differences associated with level of schooling.

5.1.1 Gender

A comparison of scores according to gender indicated a consistent trend for girls to score higher then boys. A summary of these results, expressed in terms of effect sizes, is shown in Table 10. This pattern

was consistent across all groups, and is consistent with the research evidence indicating a consistent difference in favour of girls on measures of literacy and early development.

Table 10 **Effect Sizes of Differences in Mean Scores on *Who Am I?* by Gender**

Sample	Mean Age	N	Copying Scale	Symbols Scale	Total Scale
Australia, Pre School, June	4:11	857	.34	.35	.39
Australia, First Year	5:11	1355	.29	.35	.39
Australia, Second Year	6:10	1222	.27	.29	.37
Australia, Third Year	7:80	941	.16	.28	.41
Canada (NY) Senior Kind.	6:00	687	.37	.43	.47
Canada (2000) Senior Kind.	6:00	2128	.29	.45	.44
India, Grade 1	5:90	231	.16	.27	.26
Hong Kong, Preschool	6:10	60	.41	.15	.27
Sweden, Preschool	6:60	91	.33	.22	.33

Note: Positive effect sizes indicate that the mean score of the girls is higher than the mean score of the boys.

5.1.2 Preschool Experience

Except in the case of the Indian sample, the data from these studies does not provide any direct evidence of the effect of attendance versus non-attendance in a preschool program on subsequent school achievement. In the case of the Swedish and Hong Kong samples, the children assessed were all at preschool level. In the case of the Australian sample, data on preschool attendance is available, but since preschool attendance is confounded with other factors likely to be associated with higher scores on *Who Am I?*, this data cannot provide evidence of the effects of preschool attendance as such. In the case of the Canadian sample, information on attendance at preschool or junior kindergarten prior to entry to senior kindergarten was not available.

The relatively higher performance of the Hong Kong sample, as compared with their age-matched peers, suggests that early exposure to a formal preschool program has an effect on the development of early copying and writing skills, as assessed by *Who Am I?* But, in this case, the effect may be due to the nature of the preschool program, with its strong emphasis on the early acquisition of reading and writing skills, rather than on preschooling as such, and the effect of preschooling may be less evident, or not evident at all, in a sample where a less formal and more play-centred preschool program is adopted.

In the case of the Indian sample, the data provides some evidence of the effects of a special preschool intervention program provided for children from low socio-economic backgrounds. The children who attended this program are comparable, in terms of other relevant socio-economic variables, with

children who did not attend a preschool program. Comparing the performance of this group of children against that of children with no preschool experience attending government schools, it was noted that the children who had attended the preschool intervention program scored at a consistently higher level on the *Who Am I?* tasks, with these differences statistically significant on the Symbols Scale and the overall scale, and effect sizes of .21 on the Copying tasks, .43 on the Symbols task and .40 overall. These results indicate the positive effects of preschool attendance in the case of this sample of children.

5.2 Language and Home-Background Variables

The Canadian North York sample included children from an English-language background as well as children from immigrant backgrounds whose home language was neither English nor French. Data for this sample of children included scores on the *Peabody Picture Vocabulary Test – Revised (PPVT-R)*, which is a measure of receptive vocabulary. Other socio-economic variables, including the education and income level of the parents, were also available for these children. This provided a basis for looking at the relative effects of language background and socio-economic status on performance on the *Who Am I?* tasks as compared with performance on the *PPVT-R* in this sample. However, in interpreting these results, it should be noted that this sample is not representative of Canadian children as a whole. It includes a higher proportion of children whose first language is neither English nor French (47 per cent as against the provincial average of 14 per cent and the national average of 10 per cent), as well as a higher proportion of one parent families and a lower than average income level (Connor, 2001).

Correlations between scores on *Who Am I?* and the *Peabody Picture Vocabulary Test - Revised (PPVT-R)* for this sample of children are shown in Table 11. The table also shows correlations between each of these tests and other background variables, including language background of the home, age of the child, parental income and parental educational level. These correlations are shown separately for children from English and from non-English-speaking backgrounds, as well as for the total sample.[4]

[4] Since this sample was drawn from an English-speaking area, the sample did not include any children whose first language was French. For this reason, the comparison according to language background is based on English-speaking versus non-English speaking groups.

Table 11 **Correlations Between *PPVT-R*, *Who Am I?* and Background Variables**

Correlations between:	English only (N=318)	Some or no English (N=277)	Total Sample (N=595)
Total raw score: *Who Am I?* and *PPVT-R*	.29	.16	.10
PPVT-R and Language Background	-	-	.52
Who Am I? and Language Background	-	-	-.15
PPVT-R and Age	.10	.20	.12
Who Am I? and Age	.37	.49	.40
PPVT-R and Income Level	.42	.20	.46
Who Am I? and Income Level	.06	-.05	-.05
PPVT-R and Educational Level (PMK)[5]	.27	.23	.28
Who Am I? and Educational Level (PMK)	.36	.21	.10
PPVT-R and Educational Level (Spouse)	.10	.16	.27
Who Am I? and Educational Level (Spouse)	.04	.07	.04

From Table 11 it can be seen that the correlation between scores on the *PPVT-R* and scores on *Who Am I?* for the total sample is only .10. This low correlation can, however, be attributed to the confounding effect of language background. When the correlation is calculated separately for children from an English-language background and for children whose home language is a language other than English, the correlation is higher, although still relatively low (.29 for children from an English-language background and .16 for children from a non-English-language background). This indicates that these two measures are tapping somewhat different skills (word knowledge versus symbolic representation).

The correlations of *PPVT-R* and *Who Am I?* scores with age indicate a substantially higher correlation with age for *Who Am I?* scores (.40) than for *PPVT-R* scores (.12), indicating that *Who Am I?* is more closely related to age than the *PPVT-R*. This is consistent with what would be expected, given that *Who Am I?* is designed to assess skills which are related to underlying developmental processes rather than specific learning, while vocabulary knowledge, within the limited age range included in this sample, is more likely to be related to culturally determined factors, and, particularly, exposure to a rich English-language environment. The stronger correlation between age and *Who Am I?* scores as compared with age and *PPVT-R* scores is consistent for both the English-background and the non-English-background samples. There is, however, some tendency for the correlations with age to be higher for the non-English-background group than for the English background on both *Who Am I?* (.49 as compared with .37) and the *PPVT-R* (.20 as compared with .10).

[5] PMK indicates the primary care giver (or Person Most Knowledgeable about the child), usually the mother.

The correlation between *PPVT-R* score and income level indicates a strong correlation both overall (.46) and for the English language group (.42). This correlation is rather lower for the non-English language group (.20). However, there is no relationship between scores on *Who Am I?* and income level for the total group (-.05), or for either the English background group (.06) or the non-English background group (-.05) considered separately. This suggests that the skills assessed by *Who Am I?* are less affected by economic variables than the skills assessed by the *PPVT-R*. This again indicates that these two measures are tapping somewhat different skills, and a measure of copying and writing skills is not a substitute for a measure of vocabulary knowledge. Each is tapping different aspects of development, both of which are important in children's development and readiness for learning.

The correlations with educational level indicate a tendency for scores on both the *PPVT-R* and *Who Am I?* to correlate more highly with the educational level of the primary care giver, usually the mother, than with the educational level of the spouse of the primary care giver, usually the father. This tendency is consistent for children from both English-speaking and non-English-speaking backgrounds.

5.2.1 Differential Effects of Language Background on Language Tests and *Who Am I?*

The correlations shown in Table 11 also indicate a strong positive correlation between language background and scores on the *PPVT-R* (.52) in the North York sample. In this sample, there was, however, a small negative correlation between scores on *Who Am I?* and language background (-.15), indicating that children from a non-English-language background scored higher on *Who Am I?* than children from an English language background.

The Australian sample also included a small proportion of children from a non-English-speaking background (4 to 5 per cent of the total sample). An analysis of the data from this sample indicated a similar tendency for children from non-English speaking backgrounds to score higher on *Who Am I?* than children from English-speaking backgrounds, although the English-speaking group scored higher on the language measures included in the Australian study (the *Literacy Baseline* test and *Reading Progress Tests 1 and 2*.[6]) A summary of this analysis is shown in Table 12, where the differences in

[6] The *Literacy Baseline* and *Reading Progress Tests 1 and 2* are part of a British series of tests designed to assess reading skills at primary level (see Vincent, Crumpler, and de la Mare, 1996). The *Literacy Baseline* is designed for administration at the beginning of the first year of school. This test covers pre-reading and early reading skills, including phonological awareness, concepts of print, knowledge of letter names and sounds, recognition of words through matching of picture to word, word to picture and sentence to picture and spelling (six simple words). *Reading Progress Tests 1 and 2* are group tests of reading comprehension designed for children at the end of their first and second years of school.

mean score by language background on *Who Am I?*, and on the various language measures administered, are expressed in terms of effect sizes.

From Table 12, it can be seen that while the children from an English-speaking background scored higher on the language-based measures in both the Canadian and the Australian samples, the children from a non-English-speaking background scored higher on *Who Am I?*. This tendency for children from a non-English-speaking background to score higher on *Who Am I?* is, therefore, consistent across these two samples. While the reasons for this are not immediately obvious, these findings add support to the use of *Who Am I?* as a measure of developmental level which is relatively independent of specific verbal knowledge.

Table 12 **Effect Sizes of Differences in Mean Scores on *Who Am I?* and Language Measures by Language Background: Canadian North York and Australian Samples**

	Canada	Australia, by Year of Schooling			
	North York (N=595)	*Preschool (N=513)*	*First Year (N=876)*	*Second Year (N=821)*	*Third Year (N=659)*
PPVT-R	.99				
Literacy Baseline test			.18	.45	
Reading Progress Test 1					.40
Copying Scale	-.33	-.46	-.22	-.02	-.30
Symbols Scale	-.33	-.34	-.11	.09	.09
Total *Who Am I?*	-.39	-.38	-.18	.00	-.17

Note: A positive effect size indicates that the English-background group scored higher and a negative effect size indicates that the non-English background group scored higher.

6. Use of *Who Am I?* for the Identification of Children "At Risk"

Who Am I? is designed to provide a measure of children's developmental level on entry to school, and, on this basis, to identify those children whose development may be delayed. These children are likely to require additional help in their first year of formal schooling to develop the underlying skills that are required for success in acquiring early concepts of literacy and numeracy, which will form the basis for subsequent learning and achievement in reading, writing and mathematics.

Children's performance on *Who Am I?* can be interpreted in terms of both absolute performance (that is, performance along a developmental continuum), and in terms of relative performance (that is, performance relative to their peer group, defined in terms of either age or level of schooling). Similarly, the identification of children at risk can be based on either an absolute criterion (a particular level as defined by their performance on the tasks as a whole), or a relative criterion (a cut-off based on the expected distribution of scores for children of the same age or level of schooling).

6.1 Applying an Absolute Criterion of "At Risk"

Applying an absolute criterion, the category of children at risk can be defined in terms of the children's actual performance on the tasks. Using this approach, three levels of risk category (or readiness for school) were constructed, based on responses to the Symbols items together with the Diamond task. Children who failed to achieve above Level 2 on any of these tasks were defined as "not ready" or "at risk". Children who achieved at Level 3 or above on some, but not all, of the tasks were identified as being "ready to learn", in the sense that they have acquired some understanding of symbolic representation and the conventional symbols used in reading and writing, but have not yet reached the level at which they are able to write meaningful words and sentences. Children who achieved at Level 3 or above on all the tasks were identified as advanced, in that they have reached a level of development where they are able to understand and use conventional symbols for symbolic representation of words and meanings.

The percentage of six-year-olds in each sample identified in each of these three categories is shown in Table 13. In Australia and Canada, the percentage of children who are identified as not yet ready for formal schooling (that is, in the "not ready" or "at risk" category) is about 2 per cent (1.5 to 2.3 per cent).

This percentage is a little higher in Sweden (3 per cent), and substantially higher in India (9.5 per cent). However, in Hong Kong, there are no six-year-olds who fall into this category.

In the Australian and the Canadian North York samples, about one third of six-year-olds are in the advanced category, as compared with 95 per cent in Hong Kong. This percentage is lower in Sweden and in India, as well as in the case of the Canadian Community 2000 sample. A possible explanation of this difference, particularly in the case of the two Canadian samples, is the relatively high proportion of children who do not make an attempt at the sentence task, even though they achieve a Level 3 or Level 4 response on the Word task. If they had attempted this task, some of these children may have reached a Level 3 response. This would have had an effect on the proportion of children identified in the advanced school readiness category.

Table 13 **Percentage of Six-Year-Olds in School Readiness Categories, by Country**

Sample	Level	Mean Age	% Not Ready	% Ready	% Advanced
Canada	End SK*, North York	6:00	2.3	65.0	32.7
	End SK*, Community 2000	6:00	2.1	90.0	7.0
Australia	Mid First Year of School	5:11	1.5	65.7	32.8
Sweden	End First Year of Preschool	5:11	3.0	87.9	9.1
India	Beginning Grade 1	5:90	9.5	84.9	5.6
Hong Kong	End Third Year of Preschool	6:00	0.0	5.0	95.0

*SK = senior kindergarten
Definition of Categories:
Not ready (at risk): Scores at or below Level 2 on all Symbols tasks and Diamond task
Ready (developing): Scores at or above Level 3 on at least some Symbols tasks and/or Diamond task
Advanced: Scores at or above Level 3 on all Symbols tasks and Diamond task

6.2 Applying a Relative Criterion of "At Risk"

To apply a relative criterion for the identification of children at risk, it is necessary to have a normative sample with a known distribution of scores to determine the cut-off points for identifying the "at risk" category. The definition of the "at risk" category depends on the cut-off points set to distinguish between children who are at risk and those who are not at risk. These cut-off points are usually set to identify children whose scores place them somewhere in the lowest 10 to 15 per cent of their age or school level group. A stricter criterion of "at risk" could, however, be applied by setting a cut-off based on the lowest five per cent of the age or school level group. A broader criterion of "at risk" could be applied by setting a cut-off based on the lowest 25 per cent of the age or school level group. This

definition of "at risk" is in a sense circular, since the proportion of children who are identified as at risk will depend on the cut-off applied to define the "at risk" category. A relative criterion can also be applied in cases where normative data based on a representative sample of the relevant population are available. In the case of *Who Am I?*, the only normative data available is that based on the Australian sample.

6.3 Accuracy of *Who Am I?* as a Screening Measure

In order to assess the accuracy of a screening measure for the identification of children at risk, it is necessary to have a second criterion measure to determine whether the children identified as at risk on the basis of the screening measure are subsequently found to be at risk on the criterion measure. In applying such an analysis, it should be noted that the measure of accuracy is dependent on the validity of both the screening measure and the criterion measure.

In the case of *Who Am I?*, data from the Australian study provided a means of checking the accuracy of *Who Am I?* as an indicator of possible early learning problems associated with a developmental delay. For this purpose, the procedure described by Gredler (1992; 1997) for calculating the efficiency of a screening measure as a predictor of subsequent performance was applied. This procedure is based on a two by two table, which examines the number of "hits" (accurate identification of those who are or who are not at risk) and the number of "misses" (those who are identified as at risk but who do not subsequently experience difficulties (false positives), and those who are not identified as at risk but who do subsequently develop difficulties (false negatives)). Various measures are then derived from this table, the most relevant of which are the overall accuracy or efficiency of the screening measure (the number of hits as a percentage of the total sample), and the percentage of children who are either over-identified (that is, the false positives), or under-identified (that is, the false negatives).

To obtain a measure of the accuracy of *Who Am I?* as a screening measure, scores on the *Literacy Baseline test*, a measure of early literacy skills, were used as the criterion measure. Both of these measures were administered to children in the second term of their first year of school, and the cut-off point used in both cases was 15 per cent (that is, the lowest 15 per cent on each measure was the group defined as "at risk"). For comparative purposes, these results were compared with those of

Wood et al (1984), as reported by Gredler (1992). In the case of the Wood et al study, the *Gesell School Readiness Test* was the screening measure and teacher identification of children with "special needs" was the criterion measure. In this case, the screening measure was administered one to four months after the teacher identification of the special needs status of the children, and the proportion of children identified as "at risk" on both measures was approximately 20 per cent. The results of these studies are summarised in Table 14, which shows the overall accuracy of *Who Am I?* as a screening measure, as compared with the *Gesell School Readiness Test*, as well as the percentage of children either over-identified as at risk or under-identified as at risk on both of these measures. It should be noted that, in the case of both of these studies, the data on the screening measure and the criterion measure were obtained within a relatively short interval of time (one to four months), so that these studies provide a measure of concurrent accuracy rather than predictive accuracy.

Table 14 **Measure of Overall Accuracy and Percentage of Children Either Over-identified or Under-identified As At Risk on *Who Am I?*, as Compared with the *Gesell School Readiness Test***

Screening Measure	Criterion Measure	% Cut-off for "At Risk"	Evaluation of Screening Measure		
			% Accuracy	% Over-identified	% Under-identified
Australia: *Who Am I?*	*Literacy Baseline test* (in first year of school) N = 1199	15	88	41	46
United States: *Gesell School Readiness Test*	Kindergarten outcome (teacher identification of special needs status) N = 84	20*	79	53	53

* In the case of the *Gesell School Readiness Test*, the cut-off point was a developmental age of 55.6 months.

These results indicate a satisfactory level of accuracy for *Who Am I?* in terms of agreement with the measure of early literacy skills administered a short time later. The measure of accuracy for *Who Am I?* was in fact higher than the measure of accuracy for the *Gesell School Readiness Test*, probably the most widely used measure of school readiness in the United States. *Who Am I?* also resulted in a lower proportion of children who were either over-identified as at risk or under-identified as at risk, as compared with the *Gesell School Readiness Test*. This is an important factor in considering the efficiency of a screening measure in terms of the accurate identification of children who may or may not require extra help in developing early learning skills.

In interpreting this data, it should be noted that the level of accuracy as well as the proportion of cases who are either over-identified or under-identifed as at risk will vary according to the particular cut-off points set. The stricter the criterion of at risk the higher the level of accuracy obtained. If the cut-off point for the screening measure is stricter than the cut-off point for the criterion measure, the proportion of children under-identified will tend to be higher and the proportion of cases over-identified will be lower. If the cut-off point for the screening measure is broader than the cut-off for the criterion measure, the proportion of cases over-identified will tend to be higher and the proportion of cases under-identified will tend to be lower.

7. Issues Relating to Administration and Scoring of *Who Am I?*

Some issues relating to the administration and scoring of *Who Am I?* emerged from these various studies, and particularly from the use of *Who Am I?* in the Canadian studies. These issues related mainly to the higher proportion of no attempt responses in the case of the Canadian study, and to difficulties in the scoring of responses which could not easily be allocated to a particular level on the basis of the scoring criteria provided.

7.1 No Attempt Responses

In some contexts, it was found that children were unwilling to respond to the tasks, either because of shyness or because they were unwilling to attempt the task if they felt that they could not provide a correct response. This seemed to be more common in the Canadian studies, particularly in the case of the Community 2000 samples. This difference could be due, at least in part, to the different contexts in which the tasks were presented. In the case of the Australian study, the tasks were presented by the child's teacher in a school (or preschool) situation, where the child was familiar with the person presenting the task and was used to being asked to do tasks involving writing or drawing, as in writing their own name on their drawings to identify their work. In this context, the children were used to being asked to "write", and being praised for whatever effort they made, even if their efforts at writing were no more than scribbles. In the case of the Canadian studies, the tasks were presented by an unfamiliar adult (the interviewer), who may not have had experience as a teacher and may not have been experienced in assessing young children. In this context, the children may have been less willing and less confident in responding to requests to "write", and the interviewer may also not have fully appreciated the importance of encouraging the children to attempt the tasks, even if they were unable to complete the task successfully. This apparent variation in response according to the context in which the task is administered indicates the need for the training of test administrators so that they are aware not only of the administration procedure but also of the way in which the children's responses are classified, so that they can appreciate the developmental significance of whatever response the child makes to the task and are aware of the importance of getting the child to attempt all the tasks presented.

Since it was thought that the relatively high proportion of no attempt responses in the case of the words and sentence tasks in the Canadian samples might depress the overall score on *Who Am I?* relative to that of the Australian sample, a procedure for imputing scores based on the pattern of scores on other items was developed, and scores were adjusted on the basis of this procedure (see de Lemos, 2000). However, when the overall mean scores were corrected on the basis of the imputed scores as compared with simple adjusted scores (with no attempt responses allocated a score of 1), relatively little difference in overall score was noted. It was, therefore, concluded that this imputation procedure was not necessary, and that a simple adjustment of scores was sufficient to obtain an overall estimate of development.

7.2 Scoring

The scoring of responses on *Who Am I?* is based on a four-point scale designed to identify more advanced from less advanced responses. This requires a judgement to be made of each individual response in terms of where it fits in terms of the developmental sequence. Responses which are borderline between two different categories may be difficult to classify, and there may also be inconsistencies in the application of the scoring criteria by different raters. Some variation in the classification of difficult or borderline responses by different raters is inevitable, but this variation would be expected to be random and unlikely to have any discernable effect on the overall results. However, in cases where *Who Am I?* is being used for large scale surveys or research studies, consideration would need to be given to ways in which procedures to maximize the consistency of scoring could be implemented. This could be done by checking procedures designed to identify any anomalies in scoring, or by double scoring of test booklets, or random checks of samples of booklets, to identify any anomalies in scoring or any consistent patterns of leniency or strictness by individual raters.

8. Conclusion

The purpose of the analyses reported in this paper was to investigate the applicability of *Who Am I?* across different cultural contexts and the extent to which age and level of schooling affect children's performance on these tasks. These analyses have demonstrated that scores on *Who Am I?* indicate similar patterns of development across samples of children drawn from very different backgrounds, but that the age at which the skills assessed by *Who Am I?* are achieved vary according to the cultural expectations and educational experiences to which the children are exposed.

The results of the study indicate that exposure to a highly formal teaching program at an early age leads to an acceleration of development, as indicated by the results of the Hong Kong sample, while delayed entry to a preschool program (or lack of provision of a preschool program prior to entry to school), leads to later development of the skills assessed by *Who Am I?*, as indicated by the results of the Swedish and Indian samples. To what extent this later development affects subsequent achievement at school has yet to be assessed. However, data from international studies, such as the study of reading achievement by the International Association for the Evaluation of Educational Achievement (IEA) (see Elley, 1992), would seem to suggest that, at least in Western countries, children who enter school at a later age quickly catch up with their age peers who enter school earlier, such that by age nine they are performing as well, if not better, than children who entered school earlier. The acceleration of the development of copying and writing skills, as assessed by *Who Am I?*, in the case of those children who start preschool and are exposed to formal teaching at an early age may not, therefore, necessarily translate into improved performance at later levels of schooling. Other factors, particularly the quality of schooling at later age levels, would clearly be important in contributing to subsequent levels of school achievement.

Results of the cross-cultural comparisons indicated that children in Canada, at the end of their senior kindergarten year, were performing at much the same level as Australian children of the same age, who were in their first year of schooling. These samples were generally comparable in terms of both age and school level, assuming that the senior kindergarten year in Canada corresponds to the first year of schooling in Australia. While there are some differences between these two levels of schooling in Canada and Australia (the senior kindergarten year being in most cases a half-day rather than a full-day

school program), and also a difference in the time of the school year that the Australian and Canadian data were collected (in the middle of the school year in Australia and at the end of the school year in Canada), these differences do not seem to have affected the comparability of performance across these two groups.

Both the Australian and Canadian groups were performing at a somewhat lower level than Hong Kong children of the same age, who had experienced a three year preschool program with a strong emphasis on the teaching of formal skills. However, they were performing at a higher level than children of the same age in Sweden, who were at the end of their first year of a less formal play-centred preschool program, and children of the same age in India, who were at the beginning of their first year of school, and who, in most cases, had not attended a preschool program before starting school.

Data from the Indian sample indicated an effect of preschool experience, in so far as children attending a government preschool intervention program scored at a higher level than children from a similar background who did not attend preschool prior to entry to school. Data from the other studies did not provide information on the effects of preschooling as such, since all or most children in the samples had attended or were attending preschool. In the case of the Canadian sample, information on attendance at preschool or junior kindergarten level prior to entry to senior kindergarten was not available.

In cases where information was available on performance on both *Who Am I?* and measures of language development for children from both English-speaking and non-English-speaking backgrounds, it was found that scores on the language measures showed an effect of language background while scores on *Who Am I?* did not. This indicates that *Who Am I?* provides a measure of development that is not affected by language background.

When used as a basis for identifying different categories of school readiness according to patterns of performance over the different items, it was found that, by age six years, there were relatively few children in Canada, Australia and Sweden who were performing at a low level on all the tasks, and who could therefore be classified as "not ready" for formal schooling (1.5 to 3 per cent). However, the proportion of children in this category was higher in the case of the Indian sample (9.5 per cent). There were, however, variations between these different samples in the proportion of children who were able

to succeed on all the tasks and thus demonstrated an ability to use written symbols for communicating meaning. This variation appeared to be related to level of schooling.

These results indicate that *Who Am I?* provides a valid measure of development across different language and cultural groups. Performance on the Symbols tasks shows greater sensitivity to differences in educational provision at preschool and school level, and performance on the Copying tasks is less dependent on specific learning or teaching.

Appendix

Background and Technical Information on *Who Am I?*

Who Am I?[7] was developed at the Australian Council for Educational Research (ACER) for a project investigating factors relating to children's development in the early years of schooling. The project was carried out over the period 1997 to 1999. *Who Am I?* addressed the project's need for a measure of developmental level that would cover the age range from preschool to Year 2 (age four to seven years), and which could be administered, either individually or in small groups, by class teachers. This new instrument also met the criteria of an assessment that could be scored and evaluated independently of immediate teacher judgement or observation, so that there was a means of checking the consistency of the scoring and classification of children's responses. In order to avoid an assessment that might be seen as too formal or too difficult for younger children, it was decided to focus on tasks which provided children with an opportunity to demonstrate what they were able to do, rather than tasks which involved right/wrong answers to specific questions.

Who Am I? is based on a series of copying and writing tasks which tap both underlying developmental processes and learned skills. In this way, it is designed to distinguish between achievements that are based on specific learning or teaching (such as the child's ability to write his or her own name), and achievements that are based on a more advanced level of conceptualisation (for example, the ability to copy complex geometrical forms, or to transform spoken words into written form).

Who Am I? has a number of advantages as an assessment tool which provides a measure of children's level of development at preschool or entry to school level. Its main advantages are ease of administration and scoring, the relatively short time it takes to assess each child, and the fact that the information obtained provides a valid and reliable measure of the concepts and skills that underlie early literacy and numeracy development. Because the tasks are not dependent on language, *Who Am I?* can be administered in any language, and the same scoring criteria can be applied since the principles underlying the scoring criteria are independent of the language in which the tasks are administered.

Description of *Who Am I?*

Who Am I? is a little booklet in which the child is asked to write their name, copy a series of simple geometrical shapes (a circle, a cross, a square, a triangle and a diamond), write some numbers, letters, words and a sentence, and draw a picture of themself. These tasks are designed to test a child's ability to conceptualize and to reconstruct a geometrical shape, and to use symbolic representations as illustrated by his or her understanding and use of conventional symbols such as numbers, letters and words. Responses to these tasks are classified into four levels showing a developmental progression. Criteria for the classification of responses are provided.

[7] The *Who Am I?* instrument and manuals are available from ACER Press at the Australian Council for Educational Research. The website is www.acerpress.edu.au.

Responses to the various *Who Am I?* tasks are used to construct three scales. A Copying Scale, based on the copying of geometrical figures, a Symbols Scale, based on the child's ability to produce written symbols (name, numbers, letters, words, a sentence), and a Drawing Scale, based on the child's representation of a person. The scores on all three scales can be summed to provide an overall score. Alternatively, if the drawing task is omitted, scores on the Copying Scale and the Symbols Scale can be combined to provide an overall score for these two scales only, as in the case of the Canadian use of this instrument.

Australian Norms

In the published version of *Who Am I?* (de Lemos and Doig, 1999), Australian norms are provided in the form of both age norms and school level norms. These norms are based on the sample of over 4000 children who were assessed in 1998 as a part of the research study. Age norms are provided for children from four to seven years or over in three or six-month age bands; school level norms are provided for the various school levels distinguished across the different school systems. The Australian manual also provides for the construction of an Individual Profile, allowing for the interpretation of the child's overall score, as well as his or her pattern of scores across the three scales, in terms of the expected pattern of scores for children at the same level of schooling. A Diamap for diagnostic interpretations of *Who Am I?* is also provided, as well as guidelines on the interpretation and use of *Who Am I?* results.

Canadian Norms

It is planned that Canadian norms will be developed using data from the National Longitudinal Survey of Children and Youth.

Technical Data

Technical data on the reliability and validity of *Who Am I?* are reported in the Australian manual (de Lemos and Doig, 1999). The estimate of reliability based on a Quest analysis[8] of item data was .91, indicating a high level of internal consistency for the tasks included in *Who Am I?*. A measure of stability of scores over time was provided by the preschool sample in the research study, who were assessed initially in the second term of school (May June) and again at the end of the school year (November December). The correlation between the June and November assessments was .82, indicating a high level of stability of the assessment over time for this age group. The scoring of the mid-year and end of year responses was undertaken by different raters, so this correlation also indicates a high level of consistency in the scoring of the responses between different raters.

[8] Quest is a test analysis program that can be used to analyse test data using both Rasch scaling and traditional procedures. It scores and analyses multiple choice tests as well as Likert-type rating scales and partial credit items, providing a range of different types of item statistics and reliability estimates (Adams and Khoo, 1994 1996).

The validity of a test is not based on a single measure, but on an accumulation of evidence relating to the test and what it measures. In the case of *Who Am I?* evidence of construct validity comes from the data which shows developmental trends over time, with an increase in score both according to age and according to school level, as well as information on the relationship between performance on *Who Am I?* and performance on other measures of early literacy and numeracy skills. Data from the research study indicates correlations of about .6 between scores on *Who Am I?* and scores on the *Literacy Baseline*[9] test, administered to the pre-Year 1 and Year 1 children in Term 2 or Term 3, and correlations of about .5 between scores on *Who Am I?* and scores on *I Can do Maths*,[10] a measure of early numeracy skills administered to the same group of children in the mid-year testing program. These results are comparable with other findings reported in the literature which generally indicate correlations of between .4 and .6 between various measures of development or "readiness" and subsequent school achievement (see, for example, Tymms, 1999).

Origin of *Who Am I?*

Who Am I arose out of an earlier *Copying Skills* task (Larsen, 1987), which in turn was developed on the basis of a major longitudinal study of school readiness and achievement undertaken at ACER in the 1970s. In this study, a variety of measures were used to assess school readiness and subsequent school achievement (de Lemos and Larsen, 1979).

Of the various measures of school readiness used, the measure that tended to show the highest correlation with subsequent school achievement, for children from both English-speaking and non-English-speaking backgrounds and also for children from different socio-economic levels, was the *Anton Brenner Developmental Gestalt Test of School Readiness*, with correlations ranging from .64 to .80 with subsequent measures of school achievement (de Lemos, 1980).

Of the various sections of this test, the subtest that showed the highest correlation with subsequent school achievement was the copying sentence task, which required the child to copy a given sentence ("Fred is here"). Correlations between this one task and subsequent measures of achievement at the end of the first, second and third years of school ranged from .62 to .70 (de Lemos and Larsen, 1979).

The *Copying Skills* task was similar to *Who Am I?* in that it included the copying of geometrical figures. It also included various other copying tasks, including the copying of specific numbers, letters and a sentence. However, this task did not provide any opportunity for children to demonstrate their ability to write or to produce numbers, letters or words spontaneously.

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[9] The *Literacy Baseline* is part of a British series of tests designed to assess reading skills at primary level (see Vincent, Crumpler, and de la Mare, 1996). The *Literacy Baseline* is designed for administration at the beginning of the first year of school. This test covers pre-reading and early reading skills, including phonological awareness, concepts of print, knowledge of letter names and sounds, recognition of words through matching of picture to word, word to picture and sentence to picture and spelling (six simple words).

[10] *I Can Do Maths* is a measure of early numeracy concepts which was developed at ACER as part of the same project for which *Who Am I?* was developed.

In administering the *Copying Skills* tasks, it was found that the copying of numbers and letters was for some children a demanding task that led to a feeling of failure or frustration. It was also found that this task did not always distinguish well between the more advanced children who recognised the numbers and letters immediately and could copy quickly and accurately, and less advanced children who spent a considerable time carefully copying what, for them, appeared to be a meaningless mark on paper.

In the case of *Who Am I?*, the shift in emphasis from "copying" to "writing" was designed to give children more opportunity to demonstrate their level of competence in a situation that was more open and less like a formal test situation, and at the same time to allow for children who were not able to write numbers or letters to move quickly through the booklet, but at the same time to demonstrate their level of development on the copying of geometrical figures, and also to attempt the more interesting drawing task at the end of the booklet, without experiencing a sense of failure or frustration.

Theoretical Basis of *Who Am I?*

The use of the ability to copy geometrical figures and to draw a person to assess level of development in children has been long established. For example, the ability to copy figures such as a square and a diamond have been included in measures of intelligence and development over a long period of time, dating back to the original Simon Binet test. The reason for the inclusion of these tasks is that they have been found to be valid indicators of developmental level.

Further evidence of the validity of copying tasks as a measure of developmental level is provided by Piaget's research on the development of spatial concepts in young children. This work provides a theoretical basis for linking stages in the development of the copying of geometrical forms to broader developmental processes that affect a range of cognitive abilities (Piaget and Inhelder, 1956). A replication of this research in a cross-cultural context has shown that the stages of development described by Piaget are also applicable to children from widely different cultural backgrounds (de Lemos, 1973).

The developmental stages in children's drawings of a person have been well documented (Luquet, 1927), and this task has been used as a measure of developmental level in tests such as the *Goodenough Draw-a-Person Test* and the *Anton Brenner Developmental Gestalt Test of School Readiness* (Harris, 1963; Brenner, 1964). Studies of children's early attempts at writing have also identified a developmental sequence, which is linked to a growing understanding of the way in which spoken sounds are represented by print (Ferreiro and Teberosky, 1982).

Research evidence indicates that recognition of letters is strongly related to subsequent achievement in reading (Snow et al, 1998). Relatively less data is available on the link between spontaneous writing and subsequent achievement in reading and writing. Nevertheless such tasks have been found to be good indicators of emergent literacy skills, and have been included in screening and diagnostic measures such as the *Middle Infant Screening Test* (Hannavy, 1993), and *Clay's Observation Survey of Early Literacy Achievement* (Clay, 1993).

Advantages of *Who Am I?*

In Cross-Cultural Studies

Because the skills assessed by *Who Am I?* are not dependent on language, the instrument provides a measure of development that can be used across different language groups, and also across groups with different types of written script. For this reason, it provides a unique tool for use in cross-cultural studies which require an assessment of developmental level that is comparable across different cultural and language groups. It is particularly suited to studies concerned with the effects of different types of preschool experience on children's readiness for formal schooling and their subsequent progress in school.

For Survey Use

Individual assessment of young children can be both costly and time-consuming, usually requiring skilled test administrators and costly test equipment. By contrast, *Who Am I?* can be administered relatively easily by trained interviewers in a relatively short time (usually somewhere between 7 to 15 minutes, depending on the age and individual characteristics of the child being assessed), and the cost of the materials required for its administration is relatively low. For this reason, *Who Am I?* is ideally suited for use in large-scale survey studies which require a measure of developmental level for children at preschool or entry school level. It can be administered in household surveys where the assessments are required to be administered in the home, as well as in educational studies where the assessments are administered in a school or preschool context. The fact that it can be administered in different languages is also an advantage in cases where the survey covers children from different language backgrounds.

For Classroom Use

Feedback from teachers who have administered *Who Am I?* has generally been positive. They have found that it gives them a relatively quick and efficient means of getting an overview of where the children are at the beginning of the school year, which can then be used as a basis for planning the teaching program and for identifying children who might need additional support or whose progress should be monitored. Teachers have also commented on the value of *Who Am I?* as a basis for parent/teacher interviews, particularly in cases where parents might have an unrealistic view of their child's capabilities. The fact that the booklet provides a permanent record of where a child is at at a particular point in time, and which can be used as a basis for monitoring progress over time, was seen as an added advantage. Teachers also commented on how much the children enjoyed doing the booklets, and how proud they were of their efforts; some of the children were in fact reluctant to give up the booklets, because they wanted to keep them to take home to show to their parents.

Limitations of *Who Am I?*

Like any instrument, *Who Am I?* also has its limitations. It obviously does not cover all areas of a child's development, and should be used in conjunction with other procedures and measures that assess other aspects of a child's progress and development; these would include the child's social and physical skills, their understanding of number concepts and counting skills, their oral language skills, and the skills that underlie beginning reading, such as phonemic awareness.

It should also be remembered that assessments based on any one measure are not in themselves sufficient for making judgements about a particular child. Any decisions regarding an individual child, particularly in terms of placement in a particular program, should always be based on information from a variety of sources.

It must also be emphasized that *Who Am I?* is not intended to be used as a measure for deciding whether or not a particular child is ready to start school. Children's entry to school should be based on their eligibility in terms of age rather than on an assessment of their "readiness for school" or their "social maturity". The research evidence indicates no advantage in deferring a child's entry to school (Shepard and Smith, 1986), and parents should not be pressured to defer a child's entry to school either on the basis of teacher judgement of social maturity or on the basis of the child's performance on a measure of readiness. Children do, however, vary in their level of development and the skills that they have acquired prior to entry to school, and it is important for teachers to be aware of these differences, and to plan their program accordingly.

Conclusion

Who Am I? provides a manageable, child-friendly and reliable assessment of children's developmental level which is appropriate for children at preschool and school entry level. It is relatively quick and easy to administer and score, and can be administered to children from different cultural and language backgrounds.

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